IN THE CLAIMS:

Please delete Claims 1-4 examined in the parent case.

Please add the following claims:

1.(Canceled)A process for producing effective bandwidths of a pulse laser beam of a narrow band electric discharge laser having a line narrowing unit comprising a grating and a fast tuning mechanism, said process comprising the steps of:

A) monitoring said laser beam to determine bandwidth of individual laser pulses,

B) periodically adjusting the tuning mechanism during a series of pulses so that the nominal wavelengths of some pulses in said series of pulses are slightly longer than a target wavelength and the nominal wavelengths of some pulses in said series of pulses are slightly shorter than the target wavelength in order to produce for the series of pulses an average spectrum centered approximately at the target wavelength with average spectral deviation from the target wavelength approximately equal to a desired deviation.

2.(Canceled) A process as in Clam 1 wherein said line narrowing unit comprises a piezoelectric drive unit.

3.(Canceled) A process as in Claim 2 wherein said line narrowing unit comprises a tuning mirror driven by said piezoelectric drive unit.

4.(Canceled) A process as in Claim 1 wherein the bandwidths of individual pulses are determined by determining a slit function of a spectrometer, determining a raw data spectrum, for said laser convolving the raw data spectrum with the slit function to produce a forward convolved spectrum, determining width for the forward convolved spectrum W_{FC} and a width of the raw data spectrum; W_R , and computing an estimate of the width of the true spectrum W_T by a formula equivalent to:

$$W_T = W_R - (W_{FC} - W_R).$$

5.(New)An apparatus for producing effective bandwidths of a pulse laser beam of a narrow band electric discharge laser having a line narrowing unit comprising a grating and a fast tuning mechanism, said apparatus comprising:

A) a beam monitor monitoring said laser beam to determine bandwidth of individual laser pulses,

B) a bandwidth determination mechanism determining a desired effective bandwidth for improved results in an integrated circuit lithography production operation, and ,

C) an adjusting mechanism periodically adjusting the tuning mechanism during a series of pulses so that the nominal wavelengths of some pulses in said series of pulses are slightly longer than a target wavelength and the nominal wavelengths of some pulses in said series of pulses are slightly shorter than the target wavelength in order to produce for the series of pulses an average spectrum centered approximately at the target wavelength with average spectral deviation from the target wavelength approximately equal to a desired deviation.

6.(New) An apparatus as in Clam 5 further comprising said line narrowing unit comprises a piezoelectric drive unit.

7.(New) An apparatus as in Claim 6 further comprising said line narrowing unit comprises a tuning mirror driven by said piezoelectric drive unit.

8.(New) An apparatus as in Claim 5 further comprising a wavemeter in which the bandwidths of individual pulses are determined by determining a slit function of a spectrometer, determining a raw data spectrum, for said laser convolving the raw data spectrum with the slit function to produce a forward convolved spectrum, determining width for the forward convolved spectrum W_{FC} and a width of the raw data spectrum; W_R , and computing an estimate of the width of the true spectrum W_T by a formula equivalent to:

$$W_T = W_R - (W_{FC} - W_R).$$

9.(New) An apparatus as in Claim 1 further comprising the line narrowing unit comprises a turning mirror and a turning mirror dithering mechanism.

10.(New) A photo lithography light source of bursts of pulses of laser produced light having a desired nominal wavelength and subpicometer bandwidth, comprising:

A) a wavemeter monitor monitoring the wavelength of the laser light of at least some of the pulses in each burst and providing a measured wavelength signal representative of the laser pulse wavelength;

B) a bandwidth requirement monitor receiving a signal indicative of the desired nominal wavelength and providing a wavelength control signal representative of the desired nominal wavelength;

C) a laser tuning mechanism substantially responsive to the measured wavelength not equaling the desired nominal wavelength adjusting the wavelength of pulses so that the nominal wavelengths of some of the pulses in the burst are slightly longer than the desired nominal wavelength of some of the pulses in the burst are slightly shorter than the desired nominal wavelength to produce a burst a pulses with an average spectrum centered approximately at the desired nominal wavelength.

11. (New) An apparatus of Claim 10, further comprising:

the burst of pulses also having an average spectral deviation from the desired nominal wavelength within a desired deviation.

12. (New) An apparatus as in Claim 10, further comprising:

the laser tuning mechanism comprising a line narrowing unit with a piezoelectric drive unit.

13. (New) An apparatus as in Claim 11, further comprising:

the laser tuning mechanism comprising a line narrowing unit with a piezoelectric drive unit.

14. (New) An apparatus as in Claim 10, further comprising:
the line narrowing unit comprising a tuning mirror driver by a piezoelectric drive unit.

15. (New) An apparatus as in Claim 11, further comprising:
the line narrowing unit comprising a tuning mirror driver by a piezoelectric drive unit.

16. (New) An apparatus as in Claim 10, further comprising:
the wavemeter comprising:
a laser pulse bandwidth detector comprising a spectrometer having a slit function;

A) a laser pulse bandwidth spectrum detector producing a raw spectrum data signal with a slit function bandwidth parameter representative of a bandwidth parameter of a convultion of the laser pulse spectrum and the slit function,

B) a convolver convolving this slit function bandwidth parameter with the spectrum data signal bandwidth parameter to form a forward convolved signal W_{FC}; and

C) a laser pulse bandwidth estimator estimating the laser pulse bandwidth, W_T, according to the formula $W_T = (W_R - W_{FC} - W_R)$.

17. (New) A photo lithography apparatus having a single material optical image projection lens without a second material of a different refractive index comprising;

A) a chromatic abberration correction mechanism comprising;

B) a laser light source proving bursts of laser light pulses of a desired nominal wavelength wherein the nominal wavelengths of some of the pulses within the burst are slightly longer then the desired nominal wavelength and the nominal wavelength of some of the pulses with the burst are slightly longer than the desired nominal wavelength such that the burst of pulses is within an average spectrum centered approximately at the desired nominal wavelength.

18. (New) The apparatus of Claim 17 further comprising the burst of pulses also having an average structural deviation from the desired nominal wavelength within a desired deviation.